

intricate geological problems, is exceedingly favourable ground for the development of an interest in geology, not only from a purely scientific, but also from a commercial standpoint. That such an interest was abundantly manifest in the earlier half of the last century is shown by records of numerous courses of lectures at the various public institutions, and by attempts to found a geological society both in 1840 and 1850. The latter venture lasted but a year, the earlier not so long.

The present society, with the history of which the handsome volume now under review is concerned, grew out of a "Young Men's Society" connected with Free St. Peter's Church. It was inaugurated on May 17, 1858, by eight young men, and by the end of its first summer and winter sessions had achieved a membership of ninety-eight. Since then the society has gone on and prospered. No provincial geological society can show a better record of work done or a more valuable series of Transactions than the Glasgow society. This is partly due to the exceptionally favourable surroundings, and partly to the fact that the society was able to secure contributions from men like Lord Kelvin, Sir Archibald Geikie, Prof. Lapworth, and others, some of which have become geological classics.

This jubilee commemoration volume begins with a brief account of the geology of the Clyde district. Then follows a notice of some of the earlier workers in the geology of this area, amongst whom may be mentioned the Rev David Ure, author of the "History of Rutherglen and East Kilbride" (1793), containing the first descriptions and plates of western Scottish fossils; and John Craig, theologian, poet and geologist.

Chapter ii. contains a very full and interesting account of the origin and early history of the society, reprinted from a paper by Mr. T. M. Barr in the Transactions, vol. vii. The ensuing chapters contain reviews of the fifty years' work of the society in various branches of geological inquiry. Physical and dynamical geology is dealt with by Prof. J. W. Gregory, who gives a convenient summary of Lord Kelvin's early papers. The chapter on stratigraphical geology has been contributed by Mr. P. Macnair, that on mineralogy and petrology by Mr. Jos. Sommerville, and that on glacial geology by Mr. John Smith. Special praise must be given to the chapter on palæontological geology by Mr. James Neilson. This is really a most valuable summary of western Scottish palæontology, especially of the Carboniferous rocks.

Later chapters are devoted to biographical notices of some of the society's more prominent members. There is here quite a galaxy of famous names, amongst which we note those of Lord Kelvin (president for twenty-one years), Sir A. Geikie, Prof. C. Lapworth, Dr. B. N. Peach, James Smith of Jordanhill, R. H. Traquair, and Thos. Davidson, all, with the exception of the last-named, past-presidents of the society.

The book is well got up and illustrated by a fine series of photographs of prominent members. The editing seems to have been excellently done, the only errors discoverable being the substitution of

"stations" for "sections" in the quoted title of a paper on p. 104, and the unaccountable omission of the names of T. G. Bonney, H. Woodward, and J. J. H. Teall from the list of honorary members at the end of the volume.

G. W. T.

OUR BOOK SHELF.

Unités Électriques. By Le Comte de Bailhache. Pp. x+202. (Paris: Dunod et Pinat, 1909.) Price 6 francs.

SOME time before the Cambridge school of physicists (which we have heard irreverently termed the "ion-catchers") had made even the man in the street more or less familiar with molecular dimensions, a celebrated mathematician had been making some calculations as to atomic quantities. He was much surprised at the results he obtained. On looking over his work he was unable to find any mistake, but, nevertheless, felt sure something was amiss. At last a humble physicist was able to point out to him that he had forgotten to multiply by " v ," his result being, therefore, only some thirty thousand million times too small, which put things more or less right. In this case the enormity of the error made excited grave suspicion, but it is not easy to say how many times in ordinary practice grave errors may not have arisen, for example, in the magnetic testing of iron, from failure to remember that the C.G.S. unit of current is not an ampere.

Count Bailhache's book is a useful and up-to-date summary of practically all that is required to be known by the physicist, engineer and technologist about electrical units of all kinds, dealing with matters even as recent as the Congress of Electricians held in London during October last.

Though nominally confined to electric units, the book deals in a preliminary chapter with units in general, and commences with definitions and a clear account of the evolution of the various systems in use.

A chapter on the metric system follows a fairly complete history of the work done in the establishment of the metre and the kilogram, and the determination of the volume of the kilogram of water.

The bulk of the book consists of a description of both the C.G.S. system and the various systems of practical electrical units and standards, the equations to their dimensions, their relations to one another, with a number of conveniently arranged tables.

Some account is also given of the legislation of the various countries on electrical matters, and of the labours of the various electrical congresses.

Full historical details of the evolution of the ohm, volt, &c., and the construction of the practical standards of the same, such as mercury-tube resistances, the various forms of Clark and Weston cells, &c., are also found.

The book appears to have been carefully compiled, and we have not detected any serious errors. We cordially recommend it to practical physicists and electricians.

J. A. HARKER.

Traité de Mathématiques générales à l'usage des Chimistes, Physiciens, Ingénieurs, et des Elèves des Facultés des Science. By Prof. E. Fabry. Pp. x+440. (Paris: A. Hermann et Fils, 1909.) Price 9 francs.

IN 440 octavo pages of generously spaced printing, the author gives treatises on algebra, analytical geometry, the calculus, including differential equations, and even partial differential equations and mechanics. The book is very interesting, as it is intended for persons presumably not very mathematical, and there is hardly

one page of it which can be understood by a person who has not already made a study of higher mathematics. Every now and again it seems to strike the author that he is philosophising over the head of his reader, and for a moment he drops low enough to be understood by a chemist who has given more than the usual time to mathematics, but it is only for a moment. Naturally, he does not mention dy/dx until he has quite finished his treatment of curves by analytical geometry, and the time of vibration of his simple pendulum is given as an infinite series. He does not show anywhere that he knows the problems to which the chemist, physicist, or engineer would apply his mathematics. He does not seem to know that there are mathematical principles underlying thermodynamics and the flow of heat and problems in electricity which he might have referred to. The harm done by such a presentation of the subject is incalculable; it gives a student the notion that he cannot possibly learn to use mathematics, whereas we know that almost any person can be taught to use the highest kind of mathematical weapon with confidence and security. J. P.

Probleme der Protistenkunde. I. Die Trypanosomen ihre Bedeutung für Zoologie, Medizin und Kolonialwirtschaft. By Prof. F. Döflein. Pp. 57. (Jena: Gustav Fischer, 1909.) Price 1'20 marks.

IN this monograph Prof. Döflein deals in a simple and non-technical manner with an important group of protozoan parasites, the trypanosomes, in particular those which cause important diseases of man and animals, such as sleeping sickness of man, and nagana, surra, and dourine of horses, &c., so that the medical man without special zoological knowledge can readily understand the subject.

The author considers that there is little or no evidence that these trypanosome parasites leave the body of the host in an encysted or sporulating form, which may then re-enter the body and cause infection. Infection generally occurs through the agency of an intermediate host, or, in the case of dourine, by direct contact. He regards the reputed encysted forms as probably the result of degenerative changes in the parasite. The observations of Schaudinn on the supposed transformation of certain intracellular parasites of birds into trypanosome forms are discussed, and considered to be probably erroneous. After discussing the possible evolution of these parasites, the author concludes with some remarks on the economic importance of the diseases they produce in the colonies. The book is very readable, and is well illustrated. R. T. H.

American Philosophy: the Early Schools. By Prof. I. W. Riley. Pp. x+595. (New York: Dodd, Mead and Co., 1907.)

THIS rather bulky volume is the first of a series intended to give an historical summary of the progress of philosophical thought in America. The European reader must have an unusually determined interest in the history of speculation if, from the purely philosophical point of view, he is willing to follow Prof. Riley in his studies of minor thinkers, whose names, except in a few cases, will probably be entirely unknown to him. Regarded from a wider point of view as a study of the earlier development of the "soul of a people" that has come to fill so important a place in the modern world, the book will be found both valuable and interesting.

Prof. Riley has taken advantage of his three years' tenure of the Johnston scholarship in Johns Hopkins University to acquire an exhaustive knowledge of his subject, and he presents the results of his inquiries

lucidly and attractively. After a brief historical survey and a still shorter essay on the relations between American philosophy and American politics, he develops in five successive "books" the history of the several movements—philosophical or religious—to which the thinkers of his period are related.

Of these movements the only one with which the philosophical student will, as such, feel much concern is early American idealism, which is decorated by the names of Samuel Johnson (of Connecticut) and Jonathan Edwards. Both these writers have relations with Bishop Berkeley, "the only European philosopher of the first rank who visited the colonies." Students of Berkeley already know that Johnson was his avowed admirer and follower, but they will be glad of the much fuller light which Prof. Riley has thrown upon the dealings of the two philosophers with one another. In the case of that remarkable man, Jonathan Edwards, Prof. Riley makes it manifest that his idealism was an independent development from Locke—a development the main positions of which Edwards reached at some time between his thirteenth and his sixteenth years!

The scientific reader will be tempted to give special attention to the pages on Benjamin Franklin, who, as "a kind of Socrates in small clothes," played an interesting if not imposing part in American deism, and will be reminded painfully of the bitterness of English intolerance in the eighteenth century when he comes upon the name of Joseph Priestley among the apostles of American materialism.

The Photography of Coloured Objects. By Dr. C. E. Kenneth Mees. Pp. vi+69. (Croydon: Wratten and Wainwright, Ltd., 1909.) Price 1s. net.

DR. MEES being a partner in the well-known photographic firm of Wratten and Wainwright, and writing on a subject most intimately connected with the manufactures of the firm, naturally refers almost entirely to the plates and colour filters that he is most interested in, but the volume is in no sense, or in any part of it, a trade advertisement. The author explains in a clear and straightforward way the details of the subject, and the chapters on "portraiture," "landscape photography," and "the photography of coloured objects for reproduction" have been produced by the aid of several authorities who devote themselves to these branches of work.

Many will be surprised to see the great advantage in photographing polished mahogany attainable by the use of a panchromatic plate and a red screen, as compared with the result obtained by an ordinary plate. The latter emphasises the scratches and other surface imperfections and hardly shows the grain, while the panchromatic plate gives what is obviously the natural appearance of the wood. For the correct representation of ordinary coloured objects, the general advice is to use a panchromatic plate and a rather deep yellow screen. M. Callier, in a note that he contributes, points out the practical shortcoming of the ordinary orthochromatic plate (erythrosin type) in the photography of open meadows and pine-trees. The green of the pines falls just into the gap of deficient sensitiveness in the spectrum, while the green of the meadows corresponds to the maximum of green sensitiveness: hence there is obtained an exaggerated contrast which no ordinary yellow screen will correct.

The author deals also with the suppression of certain colours, as in the photography of stained documents, the increase and decrease of contrast in coloured objects, as in photomicrography, and with three-colour photography, that is, so far as plates and colour screens are concerned. Although the volume is small it deserves an index.